**Template | Unit Enhancement**

***EXPLANATION & ARGUMENTATION***

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**Background Information**

**Instructional Materials Title: Circuits & Pathways**

**Publication Date: August 23, 2013**

**Work Group Participants: Greg Pittman, Sue Backenstose, Tim Salcedo, Diedra Jones**

**Date Developed:** **August 19-23, 2013**

**High Leverage Lesson (Title and Page Number): CBA-B, page 61 of instructional guide**

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**Rationale** (**Why we identified this particular lesson)**

**-The scientific concept of energy transformation is embedded in most of the lessons in this unit**

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***Explanation* Lesson Enhancement**

**Overview**

This enhancement/modified CBA should be given AFTER Lesson 8, instead of before

**Part 1: Lesson Modifications to Lead Up to *Explanation* Experience**

\*Starting in lesson 2 introduce class poster of forms of energy. Discuss and add new knowledge before Lesson 8 (pg. 60 of instructional guide) \*Potential 3rd column of investigations done that illustrates that form of energy

\*Possible ways to introduce/reinforce the CER Framework before this modification:

-My dad is an alien commercial

-The ‘Bird Beak’ activity

-A short discussion or reading of a high student interest “Hot Topic” from which to make a claim *(ex. Justin Beiber is the greatest artist of all time because…)*

-Lesson 5 (practice making a claim about conductors & nonconductors, supporting claim with evidence, and use reasoning to illustrate how the evidence supports the claim)

-Utilize CER templates available from PSEP packet, August 19, 2013

\*Add motors to materials box for lesson 8 and have students experiment with adding the motor to the series circuit

\*This enhancement modifies CBA-B, which should be given AFTER lesson 8.

**Part 2: *Explanation* Learning Sequence**

Review the CER Framework (introduced in previous lessons)

Give CBA-B: Students construct a scientific explanation stating a claim about the transformation of energy in a circuit, providing qualitative data about forms of energy that have been observed, and reasoning about the transformation from one form of energy (before) to another (after).

**Part 3-A: Describe Assessment Task**

Using a bulb, a motor, wires, and a D-Cell, draw and label a complete circuit system and its subsystems, showing the locations of as many forms of energy as possible.

Question: Are there energy transformations in the circuit?

Evidence: Data students collect in the investigation

Scientific Concept: Electrical energy in circuits can be changed to other forms of energy, including light, hear, sound, and motion.

**Part 3-B: Assessment Rubric**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **4** | **3** | **2** | **1** |
| **Claim** | **I stated there are several energy transformations in a circuit** | **I stated there is energy transformation in a circuit** | **I mentioned energy in the circuit** | **I made no claim**  **Or**  **I don’t think there is energy transformation in the circuit** |
| **Evidence** | **I provided 3 pieces of evidence based on my observations** | **I provided 2 pieces of evidence based on my observations** | **I provided 1 piece of evidence based on my observations** | **I provided no evidence** |
| **Reasoning** | **I provided 2 or more complete examples of reasoning that explain the types of energy before and after the transformations (conversions)** | **I provided 1 complete example of reasoning that explains the types of energy before and after the transformations (conversions)** | **I provided incomplete reasoning showing that did not show the types of energy both before and after the transformation**  ***(ex: light bulb lit which means a transformation to light energy)*** | **I provided no reasoning** |

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**Additional Information**

NOTES

· Information that will be useful when teaching this lesson

- Resources that will be useful

- Scaffolds that students will use